ORDER

CENTER RADAR ARTS PRESENTATION
PROJECT IMPLEMENTATION PLAN

March 30, 1993

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

RECORD OF CHANGES

DIRECTIVE NO. 7110.111

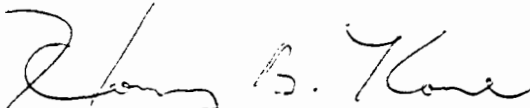| CHANGE TO BASIC	SUPPLEMENT			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FOREWORD

This order directs affected organizations to take necessary
action to implement the Center Radar ARTS Presentation (CENRAP)
function in the 20 Air Route Traffic Control Centers. Management
responsibility for this project has been assigned to the Program
Manager for En Route/TMS Automation, ANA-300. Support and
cooperation from the groups listed within this order are
essential for the successful implementation of CENRAP.

Harry B. Kane
Program Manager for En Route/TMS Automation

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CHAPTER 1. GENERAL

1. <u>PURPOSE</u>. This order transmits the Center Radar ARTS
Presentation (CENRAP) Project Implementation Plan (PIP) to the
field. The order delineates activities, responsibilities, and
schedules necessary for the implementation of the CENRAP function
in the National Airspace System (NAS).

2. <u>DISTRIBUTION</u>. This order is distributed to the division
level in the offices of the Program Director for Automation, Air
Traffic Program Management, and Training and Higher Education;
Air Traffic Rules and Procedures, Air Traffic Plans and
Requirements, Operational Support, NAS Transition and
Implementation, and NAS System Engineering Services; division
level to regional Airway Facilities and Air Traffic divisions;
division level at the Aeronautical Center and the FAA Technical
Center; and limited distribution to Airway Facilities and Air
Traffic Air Route Traffic Control Centers (ARTCC).

3.   <u>DEFINITIONS</u>. The following are definitions and acronyms
which are used in this order but are undefined in reference
documentation.

   a. <u>Contracting Officer's Technical Representative (COTR)</u>.
The person formally appointed to provide day-to-day technical
direction to the development contractor. The COTR is not
authorized to unilaterally change the contract, but he/she does
provide technical guidance to the contracting officer relative to
the contract.

   b. <u>Configuration Control Board (CCB)</u>. The CCB is a duly
appointed group authorized to establish or change a baseline.

   c. <u>Host Computer System (HCS)</u>.   The computer system
located at ARTCC's used to process radar data and drive air
traffic control radar displays.

4.   <u>AUTHORITY TO CHANGE THIS ORDER</u>. The Program Manager for En
Route/TMS Automation, ANA-300, may issue changes to this order
necessary to implement the project.

5.-19. <u>RESERVED</u>.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The CENRAP function is a capability which allows long range radar data from an ARTCC to be directed to a selected Automated Radar Terminal System (ARTS) as a backup when the local ARTS radar is not available. CENRAP is designed to be used in those areas where long range radar provides coverage of one or more ARTS terminal areas. In the event of a radar failure or scheduled outage, the ARTS facility can request radar target data from the covering ARTCC. Thus CENRAP provides both an important emergency backup capability and allows radar maintenance to be scheduled more conveniently. This order provides direction for the implementation of the CENRAP software enhancement into the ARTCC HCS software. The CENRAP function provided in this release will be used at the 20 continental U.S. ARTCC's.

21. PURPOSE. The implementation of CENRAP requires software changes to both the ARTCC HCS and the ARTS. In addition, the ARTS facility requires an additional hardware device called the CENRAP Trigger Simulator (CTS). This order applies only to the ARTCC portion of CENRAP and does not address ARTS hardware or software requirements. It is intended that the CENRAP capability be turned on by an ARTCC only at the request of an ARTS facility. Coordination necessary to start CENRAP will take place telephonically, other means such as facsimile or memorandum may also be used. CENRAP will be capable of transmitting search radar target data, beacon radar target data, or both. The operation of CENRAP will have no impact on air traffic controllers at the transmitting ARTCC. The use of CENRAP data at the requesting ARTS facility will be as specified in FAA standards and procedures. The HCS CENRAP development will also provide a baseline to the developers of the Advanced Automation System (AAS), which is to include a CENRAP function.

22. HISTORY. The concept of providing an alternative source of radar target data to an ARTS facility originated at Denver's Stapleton International Airport. FAA personnel at the airport were concerned over delays at the airport caused by occasional failure of the local Airport Surveillance Radar (ASR). In December 1979 tower and ARTCC personnel developed and tested software to test the feasibility of using Air Route Surveillance Radar (ARSR) data for the Denver ARTCC to the Denver Tower ARTS facility. The concept proved successful and was approved as a local patch. Later, in April 1990, a national patch was developed to allow the CENRAP function to be used in other ARTCC locations. NAS Configuration Control Decision (CCD) N12446 approved the development of a CENRAP national patch. The CENRAP

Chap 2
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patch currently continues to operate in the HCS software.   In
June 1990 CCD 12480 was approved which authorized the development
of a CENRAP function in the HCS software.   CCD 12480 is included
in this order as appendix 1.   In October 1989 a contract was
awarded to Computer Resource Management, Inc. (CRMI) to develop
the national patch into an integral part of the HCS software.
The development effort was underfunded and the delivered product
proved to contain errors which were unacceptable to the FAA.   In
July 1991 Diez Management Systems, Inc., was awarded a contract
to first determine and document all of the FAA systemwide
requirements for CENRAP, based on CCD 12480; and to incorporate
the original capability plus all needed enhancements into the HCS
software.

23.-29.   RESERVED.

CHAPTER 3.   PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The basic CENRAP function is to provide long-range radar data from an ARTCC to a requesting ARTS facility within radar coverage of the ARTCC. Figure 3-1 shows the CENRAP functional relationships. The following functions will be incorporated into the CENRAP capability.

   a. Radar Target Selection. Initial radar target processing first makes the determination that the CENRAP function has been activated. If CENRAP is not on, normal NAS radar processing occurs. However, if CENRAP is on, additional CENRAP processing is necessary. The CENRAP function will determine whether the radar target is search radar target or beacon radar target. The target will then be screened against data requirements of coverage, range, and altitude, for the specific requesting ARTS facilities. Only radar targets which meet all data criteria will be transmitted by CENRAP.

   b. Coordinate Conversion. Radar position data received at the ARTCC is expressed in a cartesian coordinate system adapted for the particular site. Radar positions which are to be transmitted to a requesting ARTS facility will be converted to the coordinate system appropriate for use at each requesting facility.

   c. North Mark. CENRAP will periodically generate a radar data message to each requesting ARTS facility indicating a beacon radar target at an adapted distance and with an azimuth of due north. The north mark is used by the ARTS facility for reference purposes. This north mark message will be generated at a time to coincide with the receipt of a radar beacon test message from an ARTCC adapted long-range radar.

   d. Preferred/Supplemental Radar Processing. A given radar target at an ARTCC may be visible to more than one long-range radar, however only one target is to be transmitted to each requesting ARTS facility. CENRAP will confirm that each radar target transmitted to a requesting ARTS facility is from the radar specified as "preferred" for the requesting ARTS facility.

   e. Range Check. Long-range radar data at an ARTCC is initially selected for radar sort boxes as specified for particular ARTS sites. It is, however, possible that a radar target in a peripheral sort box is actually farther than 60 nautical miles from the requesting ARTS facility. CENRAP will

ensure that only radar targets actually within 60 miles of each requesting ARTS facility are transmitted to that facility.

f. <u>Message Generation.</u> CENRAP will generate interfacility messages containing radar target data in the correct format for all radar targets which meet all of the criteria specified for each requesting ARTS facility.

g. <u>Message Transmission.</u> CENRAP will transmit radar target data messages to the correct requesting ARTS facility via the existing interfacility data channel.

h. <u>CENRAP Control.</u> CENRAP will be controlled at the ARTCC by the NAS Operations Manager (NOM) or the NAS Area Specialist. The NOM/NAS Area Specialist will be allowed to selectively turn the CENRAP function on and off for any adapted ARTS facility, and to determine current CENRAP status.

31. <u>PHYSICAL DESCRIPTION</u>. The CENRAP function is a software capability and does not require the addition of any new hardware components at an ARTCC.

32. <u>SYSTEM REQUIREMENTS</u>. CENRAP requires only that the peripheral adapter module replacement item (PAMRI) be available at an ARTCC in order to utilize the CENRAP functionality. The contractor, Diez Management, Inc., is using the current HCS development baseline to produce the CENRAP capability.

33. <u>INTERFACES</u>. CENRAP communications with the ARTS facilities will utilize the existing interfacility data channel via the PAMRI. Unique message types will be created to support the transmission of radar target data to the requesting ARTS facilities.

34.-39. <u>RESERVED</u>.

FIGURE 3-1. CENRAP DESIGN ARCHITECTURE

Digital radar data

RADAR input processing

CENRAP processing

Input Message Processing

Output Message Processing

CENRAP control messages

CENRAP radar data to ARTS

Host Computer System Software
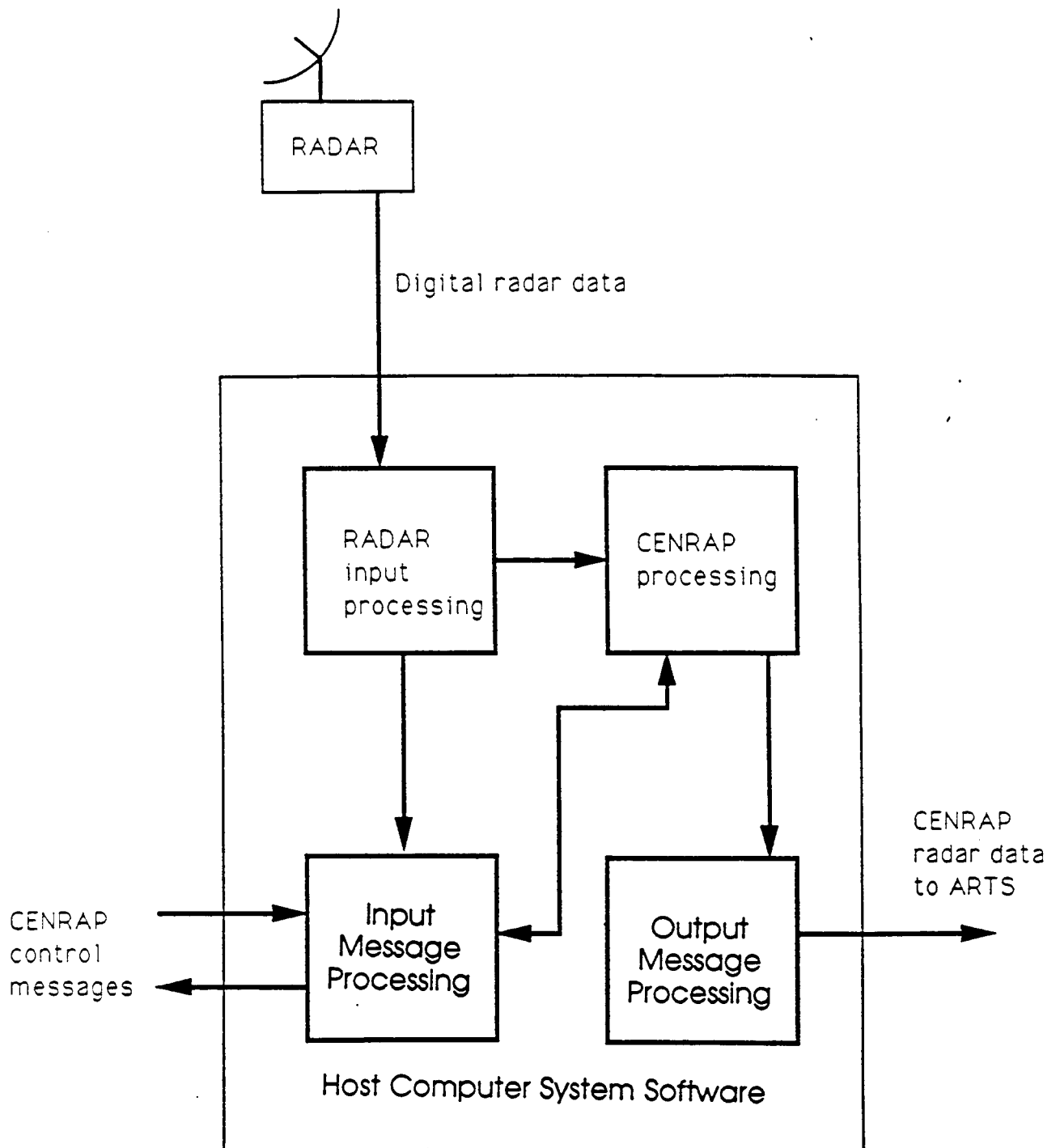
CHAPTER 4.   PROJECT SCHEDULE AND STATUS

40.   PROJECT SCHEDULES AND GENERAL STATUS.   The CENRAP project
relies on the master program schedule for reporting and
monitoring activities.   The schedule contains milestones that are
of interest to the CENRAP project manager and status is reported
monthly by the development contractor.   This schedule is updated
as required by the project manager.

41.   MILESTONE SCHEDULE SUMMARY.   The key milestones for the
CENRAP development and implementation effort are provided in
Figure 4-1, CENRAP Milestone Schedule.   The National Automation
Field Support Division, AOS-420, will incorporate CENRAP into an
operational release of the HCS software.   The target release will
be determined by AOS-420.

42.   INTERDEPENDENCIES AND SEQUENCE.   The CENRAP schedule is
essentially independent of other activities.   Communication of
CENRAP data does depend on the presence of PAMRI at the sending
ARTCC, however, the PAMRI Program is in place and does not appear
to represent a risk to CENRAP.

43.-49.   RESERVED.

FIGURE 4-1.   CENRAP MILESTONE SCHEDULE

Contract Award	July 1991
System Requirements Review	November 1991
System Design Review	December 1991
Software Specification Review	August 1992
Preliminary Design Review	December 1992
Master Test Plan	May 1993
Critical Design Review	May 1993
Test Readiness Review	December 1993
Acceptance Test	February 1994
Functional Configuration Audit/	
Physical Configuration Audit (FCA/PCA)	February 1994
Operational Test and Evaluation/Integration	
and Operational (OT&E/I&O)	May 1994
Operational Test and Evaluation/Shakedown (OT&E/S)	
	October 1994
Key Site Test Complete	December 1994
Product Fielded	July 1996

CHAPTER 5.   PROJECT MANAGEMENT

50.   PROJECT MANAGEMENT, GENERAL.   The technical management of
the CENRAP project is the responsibility of the Program Manager
for En Route/TMS Automation, ANA-300.   This organization manages
the CENRAP project within guidelines provided by FAA policies,
directives, and procedures.   The CENRAP COTR, ANA-130, is the
focal point for all activities and is responsible for the
day-to-day management of the project.   The matrix management
approach adopted by the FAA is used to support the CENRAP
development effort and to ensure that all interested
organizations provide appropriate input.

51.   PROJECT CONTACTS.   The individuals with direct CENRAP
project responsibilities are listed, together with their
organization and phone number, in Table 5-1, Project Contacts.

52.   PROJECT COORDINATION.   This order addresses the specific
responsibilities and interactions of the organizations involved
in the development and fielding of the CENRAP capability and will
serve as the primary coordination document.   The program
directive (PD) between ANA-300 and the Air Traffic Control (ATC)
Sustaining Engineering Division, ACN-100, for FY 1992 sets forth
the level of contract support that ACN-100 will apply to the
CENRAP project.

     a.   Program Manager for En Route/TMS Automation, ANA-300.
ANA-300 is the program manager (PM) for acquisition and
development and maintains responsibility until completion of
field implementation.   The primary role of ANA-300 is to manage
the overall program performance and control the CENRAP budget and
schedule.   ANA-300 is supported by associate program managers for
program, technical, and test management.   Technical support is
provided by the Associate Program Manager for Engineering (APME),
the Associate Program Manager for Requirements (APMR), and the
Associate Program Manager for Procedures (APMP).   Test support is
provided by ACN-100, as the designated Associate Program Manger
for Test (APMT).   The APMT activities are based on a program
directive between ANA-300 and ACN-100 which is reviewed yearly.
Specific ANA-300 test responsibilities are defined in
Order 1810.4B, FAA NAS Test and Evaluation Policy.

     b.   Automation Engineering Division, ANA-100.   ANA-130
provides matrix technical support to ANA-300 for the CENRAP
project.   ·The relationship between ANA-300 and ANA-130 is
specifically defined in the APME charter.   The APME for En
Route/TMS Automation is the project's technical liaison and is

TABLE 5-1. PROJECT CONTACTS

Name	Telephone No.	Function	Organization
Bruce Williamson	202/267-8333	Technical Officer	En Route/TMS Automation, ANA-130
Kenneth Mankins	202/267-8344	Alternate Technical Officer	En Route/TMS Automation, ANA-130
Fernando Anzola	202/863-9240	Project Support	Systems Engineering and Technical Assistance (SETA)
Sharon Compher	202/267-7071	CENRAP Coordinator	Automation Planning Branch, ATR-210
Dorothy McGehean	609/484-4272	CENRAP Coordinator	Terminal Field Support Branch, AOS-410
Larry Paschich	202/267-9341	CENRAP Coordinator	En Route Procedures Branch, ATP-120
Dennis Emmerick	609/484-6245	CENRAP Coordinator	Terminal Systems Engineering Branch, AOS-340
David Dosch	609/484-6245	CENRAP Coordinator	Terminal Systems Engineering Branch, AOS-340
Mark Starnes	202/267-3288	CENRAP APML	NAILS Implementation Branch, ANS-430
Richard Smith	609/482-6067	CENRAP Coordinator	En Route Field Support Branch, AOS-420
Sigmund Chow	609/484-5954	CENRAP Test Coordinator	ATC Sustaining Engineering Division, ACN-100
Sandy Serafin	202/646-2234	CENRAP Coordinator	Automation Division, ASE-100
Ronnie Raffensperger	202/646-6976	Configuration Audit	System Engineering and Integration Contractor, ASE-620
Sherlock Bruce	202/267-8384	CENRAP Contract Specialist	Automation/Advanced Automation Branch, ASU-350
Bradley Bowen	609/965-8623	Project Manager	Diez Management Systems, Inc.

responsible for day-to-day monitoring, coordination, and review activities. Included in the role of APME is the responsibility to review and approve all products delivered and presented by the software development contractor. The APME is also the COTR and is responsible for coordinating activities during CENRAP software development, test, and integration. The System Engineering and Technical Assistance (SETA) contractor will support the APME with the execution of these duties.

   c. <u>System Plans and Programs Division, ATR-100</u>. The En Route Branch, ATR-110, serves as the APMR and is responsible for coordinating with the En Route Procedures Branch, ATP-130, and the Automation Planning Branch, ATR-210, to ensure that a consensus is achieved on all CENRAP requirements. During the requirements, design, and development phases, the APMR will be required to attend all reviews and provide formal evaluation of the contractor's interpretation and implementation of requirements. During CENRAP Operational Test and Evaluation (OT&E), the APMR will oversee the development of test objectives and execution of the tests. In addition, the APMR will be the primary interface between FAA headquarters and the designated key test site.

   d. <u>Automation Software Policy and Planning Division, ATR-200</u>. ATR-210 is responsible for ensuring that all requirements for the CENRAP function are clearly defined during the requirements phase of the project. ATR-210 will provide inputs to the CENRAP requirements case file and provide final approval. During the requirements, design, and development phases, ATR-210 will be required to attend all reviews and provide formal evaluation of the contractor's interpretation and implementation of requirements. ATR-210 is also considered the primary air traffic interface at the FAA headquarters on performance and requirements issues.

   e. <u>National Automation Field Support Division, AOS-400</u>. The En Route Field Support Branch, AOS-420, is responsible for the development and maintenance of en route software releases. AOS-400 is responsible for providing development contractor access to baseline software on the Computer Support/Systems Development facility. AOS-400 will support CENRAP OT&E/integration and Operational (OT&E/I&O) and CENRAP OT&E/shakedown (OT&E/S). AOS-400 is responsible for review and comment of the OT&E/I&O Test Plan which will be prepared by ACN-100 prior to OT&E/I&O testing. AOS-400 is responsible for observing the OT&E/I&O tests and reviewing the test results. In support of OT&E/I&O, AOS-400 will provide resources to assist in

the development of test scenarios and field test site adaptation at the FAA Technical Center. AOS-400 will participate in requirements, design, and code reviews. Prior to the FCA/PCA, AOS-400 will support the Configuration Management Branch, · ASE-620, in developing an audit plan. AOS-400 will review and approve the plan. After successful completion of the OT&E/I&O AOS-400 will accept the CENRAP software for integration into the NAS HCS release designated by the Air Traffic Configuration Control Board.

f. Air Traffic Procedures Division, ATP-100. ATP-130 serves as the APMP and will develop procedures required for CENRAP operational implementation. The APMP will participate in requirements, design, and code reviews. The APMP participates as a member of the Configuration Control Board; coordinates, along with the Air Traffic Plans and Requirements Automation Planning Branch, ATR-210, and the Air Traffic Plans and Requirements En Route Branch, ATR-110, training requirements for use of the CENRAP automation aids with the Office of Air Traffic Program Management Training Requirements Program, ATZ-100.

g. Configuration Management and Engineering Support Division, ASE-600. ASE-620 will develop an FCA/PCA Plan which will be reviewed and approved by the APME and AOS-400. Upon completion of development test and evaluation (DT&E) and the contractor's internal FCA/PCA, ASE-620 will conduct the formal Government Functional Configuration Audit/Physical Configuration Audit (FCA/PCA) which will be approved by AOS-400 and the APMR.

h. ATC Sustaining Engineering Division, ACN-100. As the designated APMT, ACN-100's primary function is to oversee the test and evaluation program. The roles and responsibilities of the APMT and other organizations are defined in Order 1810.4B and the ANA-300/ACN-100 PD. As lead CENRAP test organization, the APMT will be responsible for developing an approved CENRAP Master Test·Plan which identifies all facets of testing associated with the program. For OT&E/I, the APMT will develop and submit an Integration Test Plan to the APME and AOS-400 for review and comment. Approval of the document will be provided by the PM. The APMT will be responsible for conducting OT&E/I and providing test results in a test report to the APME and AOS-400. The APMT will also be responsible for tracking and ensuring the resolution of Program Technical Reports (PTR) identified during DT&E and· OT&E/I.

     i.   <u>NAILS Program Division, ANS-400</u>. ANS-430 serves as the Associate Program Manager for Logistics (APML) and will develop an Integrated Logistics Support Plan (ILSP) in support of the CENRAP project. The ILSP will address the subjects of software maintenance approach and necessary training for the ARTCC supervisory personnel who use CENRAP.

TABLE 5-2.   PROJECT RESPONSIBILITY MATRIX

Organization	ANA-300	ANA-130	ASU-300	ATM-100	ATR-100	ATR-200	AOS-400	ANS-400	ASE-600	ACN-100
Activity										
Program Management	L	S/R	S	S	S	S	S	S	S	
Contract Management	S	L	S							
Operational Requirements	S	S		S	S/R	S/R	S/R			
Operational Procedures				R	R	R	R	R		
Functional Requirements				L						
Automation Requirements					L					
Review Approval										
Integrated Logistics										
Configuration Audit	S	S/W	R	R	S	R	R	L		S
OT&E/Integration & Operational		R	R		S		S			L
OT&E/Shakedown		S					L			L
Deployment	S	L	S							
Maintenance	S	L			S					

Key: L   Lead organization
      S   Supports lead organization activities
      W   Writes plans and results
      R   Review plans and results

    j. <u>Contracting Division, ASU-300</u>. ASU-300 is designated as
the Associate Program Manager for Contracting (APMC). The APMC
is the Contracting Officer (CO) and is responsible for the award,
legal aspects, and the management of the CENRAP contract. All
changes to the contract must be approved by the CO. The CO is
the only person authorized to make changes to the contract which
will affect price, deliverables, or performance.

53. <u>PROJECT RESPONSIBILITY MATRIX</u>. Table 5-2, Project
Responsibility Matrix, is used to identify the major program
activities associated with implementation and the responsible
organizations.

54. <u>PROJECT MANAGERIAL COMMUNICATIONS</u>. Meetings for the
resolution of technical issues associated to the CENRAP project
will be scheduled as needed. These meetings will include
representatives from air traffic, the program office, and
developmental and technical support contractors, and others as
needed. Administrative and contractual issues associated with
the CENRAP project are discussed during the CENRAP monthly
management meeting. Meeting attendance normally includes
ANA-130, Diez Management, ATR-400, and ACN-100. Status of the
project is reported bimonthly to ANA-1 in the Program Director
Status Review (PDSR). The report consists of the current program
milestone chart and a narrative to describe lower level
accomplishments, program concerns and issues, and action plans to
resolve those concerns and issues. Four times a year a formal
program briefing is provided by ANA-130 to ANA-300 on the
progress and status of the CENRAP development effort. The
briefing includes the technical and financial status of the
CENRAP project.

55. <u>IMPLEMENTATION STAFFING</u>. No additional staffing is required
to support field testing or implementation of the function.

56. <u>PLANS AND REPORTS</u>. The development contractor will use the
set of plans specified in the contract to guide the development
effort. These plans are: the Management Plan, the Computer
Software Quality Program Plan, and the Configuration Management
Plan. All development will conform to the procedures specified
in these plans. The program office and the APME will use this
order as the guiding plan for the CENRAP development effort. The
CENRAP project has been granted exemption from the guidelines
established in the Deployment Readiness Review (DRR) process.

57. <u>APPLICABLE DOCUMENTS</u>. The following is a listing of CENRAP
project-related documents. They provide information, policy, and
directives applicable to CENRAP implementation. Any conflicts
between these and other regional guidance should be referred to
the CENRAP Project Manager for resolution.

    a. <u>FAA Standards</u>.

        FAA-STD-024a   Preparation of Test and Evaluation
                          Documentation

        FAA-STD-036   Preparation of Project Implementation
                          Plans

    b. <u>FAA Orders</u>.

        Order 1320.1D   FAA Directives System

        Order 1810.4B   FAA NAS Test and Evaluation Policy

        Order 1800.58   National Airspace Integrated Logistics
                          Support Policy

    c. <u>CENRAP Documentation</u>.

        CCD 12480   Center Radar ARTS Presentation, June 1990

        CENRAP MTP   CENRAP Master Test Plan, March 1992

58.-59.   <u>RESERVED</u>.

CHAPTER 6.   PROJECT FUNDING

60.   PROJECT FUNDING STATUS.   The CENRAP project is funded via
FAA Facilities and Equipment appropriations.   Funding for the
development of CENRAP was appropriated in FY 90.   A development
contract was awarded in July 1991 to Diez Management Systems
Inc., contract number DTFA01-91-Y-01023.   Funds have been
allocated to Diez Management under the CENRAP contract, DTFA01-
91-Y-01023, through fiscal year 1992.   Future year funding, FY 93
and beyond, has been budgeted to accommodate integration of
CENRAP into functionality into the HCS software baseline.

61.-69.   RESERVED.

CHAPTER 7. DEPLOYMENT

70. <u>GENERAL DEPLOYMENT ASPECTS</u>. Because the CENRAP function
will be part of a national HCS release, the software will be
subjected to procedures and guidelines used for incorporating new
enhancements into the latest field baseline. AOS-400 will
assemble the HCS release which will incorporate the CENRAP
function. Prior to operational deployment, CENRAP will be field
tested at the Seattle ARTCC. The contractor will complete the
CENRAP software by February 1994 for handoff to AOS-400 in June
1994 after OT&E/I testing has been completed by ACN-100. Under
the direction of AOS-300, AOS-400 will then perform formal OT&E/S
testing. Key site testing will follow OT&E/S.

71. <u>DEPLOYMENT READINESS REVIEW</u>. The DRR process is being
invoked during the development and implementation of the CENRAP
software. The initial DRR team meeting was held in February 1992
to review the DRR checklist. The CENRAP HCS software will not
require a DRR since it only involves software enhancements. The
current DRR procedures require the resolution of all noted DRR
issues prior to the AOS-400 handoff and the decision to allow all
ARTCC's to operationally use the CENRAP function.

72. <u>SITE PREPARATION</u>. There are no special site preparations
required to implement the CENRAP function.

73. <u>DELIVERY</u>. CENRAP software will be delivered to the field as
an integral part of an HCS release to be assembled by AOS-400.
As explained in paragraph 70, the schedule illustrated in table
7-1 will be used for delivery of the CENRAP function.

74. <u>INSTALLATION PLAN</u>. The HCS baseline software containing the
CENRAP function will be installed at all sites using standard air
traffic installation procedures for new releases. These
procedures include the incorporation of new CENRAP parameters to
the site adaptation data base at each facility.

75.-79. <u>RESERVED</u>.

TABLE 7-1.   CENRAP IMPLEMENTATION SCHEDULE

Acceptance Test	February 1994
FCA/PCA	February 1994
OT&E/Integration & Operational	May 1994
OT&E/Shakedown	October 1994
Independent ARTCC Test	December 1994
Key Site Test	December 1994
CENRAP Operational at all ARTCC's	July 1996

CHAPTER 8. VERIFICATION

80. FACTORY VERIFICATION. Contractor developed software for
CENRAP will be fully tested by Diez Management at the FAA
Technical Center prior to handoff to AOS-400. Diez will perform
formal acceptance tests to verify that all CENRAP requirements in
CCD 12480 have been met. Diez testing will also ensure that the
developed software integrates into the HCS software without
degradation of either NAS or CENRAP. All contractor developed
test plans and test procedures will be reviewed and approved by
ANA-300, ATR-210, and AOS-400 prior to testing. After testing,
all test results, input data, and recorded results will be made
available to the Government for verification.

81. CHECKOUT. Verification that the CENRAP function is
operating properly in the field will be accomplished during the
6-month operational evaluation at an ARTCC selected through
coordination after OT&E/I&O is complete.

82. CONTRACTOR INTEGRATION TESTING. As part of DT&E, Diez will
perform regression testing to validate the integrity of HCS
functions with CENRAP included. In addition, Diez will execute
performance measurement tests to quantify the impact on HCS with
the addition of the CENRAP software. The performance tests are
based on established air traffic workload scenarios.

83. CONTRACTOR ACCEPTANCE INSPECTION (CAI). CAI will be
performed during the FCA/PCA of the CENRAP software and
documentation in February 1994. All issues and action items
resulting from the audit must be resolved prior to the software
being delivered to AOS-400 in June 1994.

84. FAA INTEGRATION TESTING. Integration testing of the CENRAP
function will be performed by ACN-100 and AOS-400. ACN-100 will
be responsible for developing an OT&E/I&O test plan and
performing OT&E/I&O of the CENRAP software prior to the June 1994
handoff date. The software will go through a series of
operational and integration tests during this process to ensure
that the HCS is not degraded when combining CENRAP with new HCS
baseline. These tests will be completed prior to the key site
test.

85. SHAKEDOWN AND CHANGEOVER. The CENRAP function will be
subjected to an extensive OT&E/S effort. A series of tests will
be performed at the FAA Technical Center by AOS-300 and AOS-400

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to assure that the user interface is acceptable, that overload
thresholds have been identified, and that user documentation is
correct and matches the delivered software.

86. <u>JOINT ACCEPTANCE INSPECTION (JAI)</u>. JAI will not be
performed due to the CENRAP function being included as part of an
HCS software release.

87.-89. <u>RESERVED</u>.

CHAPTER 9.   INTEGRATED LOGISTICS SUPPORT

90.   <u>MAINTENANCE CONCEPT</u>.   Upon successful completion of the configuration audit, the contractor delivers the developed software to the Government and AOS-400 accepts maintenance responsibilities.   ANS-430 will develop an ILSP for CENRAP which will specify the maintenance concept and training requirements. AOS-400 will continue maintenance support through the life cycle of the program.

91.   <u>TRAINING</u>.   Training necessary for CENRAP will be provided for ARTCC supervisors and air traffic software personnel only. No training is necessary for air traffic controllers at the ARTCC's.   Air traffic software training will be provided via the CENRAP Adaptation Users' Guide and as specified in the ILSP. Training at ARTS sites will be conducted as required to comply with order 7110.109, Center Radar Presentation.

92.   <u>SUPPORT TOOLS AND TEST EQUIPMENT</u>.   Implementation of the CENRAP function does not require the use of any special support tools.

93.   <u>SUPPLY SUPPORT</u>.   Supply support is not required for the CENRAP project.

94.   <u>VENDOR DATA AND TECHNICAL MANUALS</u>.   The technical description of the CENRAP function is found in the contractor developed CENRAP Computer Program Functional Specification (CPFS).   This CPFS will become part of the NAS-MD series which is made available to technical support personnel at the FAA Technical Center and ARTCC's.   The CENRAP Adaptation Users' Guide will also be provided for modification of site specific data with new CENRAP parameters.

95.   <u>EQUIPMENT REMOVAL</u>.   The implementation of CENRAP does not require the modification or removal of existing hardware.

96.   <u>FACILITIES</u>.   Impacts to the ARTCC facilities include only modifications to site adaptation data bases and air traffic CENRAP training prior to operational deployment.   These requirements are considered standard with the implementation of a new software field release.   There are no changes required to the physical plant at any ARTCC to implement CENRAP.
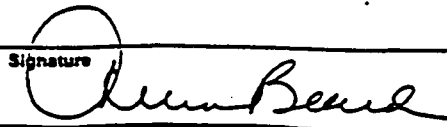
97.-99.   <u>RESERVED</u>.

APPENDIX 1.
CENRAP CONFIGURATION CONTROL DECISION

NAS CONFIGURATION CONTROL DECISION		
1. TO: (NCP/CCD WEEKLY PACKAGE DISTRIBUTION)		
2. NCP TITLE 12480 - CENTER ARTS RADAR PRESENTATION (CENRAP) SOFTWARE DEVELOPMENT		**3. CCD NUMBER** N12480
4. CASE FILE NUMBER AP310-CPF-005	**5. SITE LOCATION** NATIONAL	**6. END ITEM NUMBER** CPF

7. ACTION DIRECTED (In accordance with 1100.1 Change 123)

Accomplish the actions described under NCP 12480 dated January 30, 1990.

ACTION: ATR-200 - Coordinate and schedule the implementation of this approved change.

           - Implement in future system version.

           - Update NAS-MD-310, 311, 315, 326 and 631 to reflect the change and provide ASE-621 with a copy.

           - Notify ASE-620 in writing upon completion.

        ASE-620 - Update CM/STAT to reflect the status of this change.

        ASE-621 - Update DOCCON upon receipt of the documentation.

8. REMARKS

9. DECISION ☒ Approved ☐ Disapproved	**10. DATE** 6/14/90	**11. SIGNATURE AND TITLE** Chairman, Auto. Software Policy & Plan. Div. (ATR-200)
12. EXPLANATION OF NCP DISAPPROVAL		
(Date)		

NAS CHANGE PROPOSAL (Please Type or Print Neatly)	FOR CM USE	Date Received 1-30-90	NCP N12480		Page 1 of 3

1. Prescreening Office ☐ APM-150 ☐ ATR-100 ☐ APM-160 ☐ ATR-200 ☒ ASE-200	2. End Item Number	3. Scope of Change ☐ Local ☒ National ☐ Test ☐ NAS Plan	4. Case File Number AP310-CPF-005

5. Program Element ☒ En Route ☐ Flight Service ☐ Interfacility Comm ☐ Terminal ☐ Ground-to-Air ☐ Maint & Ops Support ☐ Other _____	6. Life-Cycle Phase ☐ Requirements Determination ☐ Subsystem Acquisition ☒ Operational	7. Priority ☒ Normal ☐ Time Critical ☐ Urgent

8. Supplemental Change Form ☐ RCP ☐ ECR ☐ Emp. Sugg. ☐ _____	9. Supplemental Change Number	10. Baseline Document Type ☒ CPFS ☐ IRD/ICD ☐ T.I. ☐ EEM/PEM ☐ Spec. ☐ Maint. Handbk. ☐ Dwg. ☐ _____	11. Baseline Document Number NAS-MD-310,311, 315, 326, and 631

12. Originator Allen Beard	13. Originator's Organization AAP-312	14. Telephone Number FTS 267-8342	15. Date Initiated January 27, 1990

16. Facility/Identifier (FACID) FAA HQ	17. Facility Code	18. FA Type Number	19. Serial Number

20. Title (as descriptive as possible, and if applicable, include location and runway number).

Center ARTS Radar Presentation (CENRAP) Software Development

21. Description: (a) Identification of problem, (b) proposed change, (c) interface impact, (d) cost, (e) benefits, (f) schedule, (g) justification of time critical/urgent.

(a) Problem: When the Airport Surveillance Radar (ASR) is out of service due to equipment failure or scheduled maintenance, there is a major disruption to the air traffic flow within the Automated Radar Terminal System (ARTS).

(b) Proposed Change: Transfer primary and/or secondary radar information from Air route Traffic Control Centers (ARTCCs) to ARTSs for display when the ASR is unavailable for operational use. Host Computer System (HCS) software will be developed and tested which will provide single site Air Route Surveillance Radar (ARSR) target data from Long Range Radar (LRR) to the ARTS, utilizing the Interfacility Data Set (IFDS) and interfacility lines.

Designated ARTSs will be provided radar data from the ARTCC in whose area of responsibility the ARTS resides. The HCS software will allow each ARTCC to support a maximum of 32 ARTSs with this data.

Additional software to the NAS en route system includes modifications to the Data Analysis and Reduction Tool (DART) and updates to the Adaptation Controlled Environment Subsystem (ACES).

(c) Interface Impact: The development of new operational procedures will be required for the ARTSs during periods when the terminal radar is unavailable due to scheduled maintenance or equipment failure.

(d) Cost: An estimated 4K lines of code will be required to incorporate the CENRAP function into the HCS.

(attach additional sheets if necessary)

22. Title of Originating Office Manager En Route SW Development & Support Project Mgr.	Signature [signature: Allen Beard]	Date 1/26/90

(e) <u>Benefit</u>: LRR data will be available to the ARTS during periods of
     terminal radar data loss.

(f) <u>Schedule</u>: The CENRAP software will be released in an HCS baseline to be
     designated by ATR-400.